



Flo-Lab 2100-SX2

Calibration Test and Pressure Test,
Cuff Volume Calibration / Verification,
and Computer Maintenance



Notice

This information has been provided to assist you in meeting accreditation standards set forth by the Intersocietal Commission for the Accreditation of Vascular Laboratories (ICAVL).

Parks recommends that you perform the complete field calibration procedure on your Parks Flo-Lab after every 1000 hours of use or once a year.

To perform both the calibration test and the cuff volume verification/calibration test, it will be necessary to purchase the calibration test fixture (Parks part #80-2100) and for units purchased after May 2007 the 1000 ml chamber (Parks part #986-3003-26) from the factory.

Please call Parks Medical Electronics, Inc. at 1-800-547-6427 option 0, M-F, 7:00AM—3:30PM Pacific Time. We will need the model number of your instrument to provide the correct calibration equipment.

Parks Medical Electronics, Inc.

Mailing Address: PO Box 5669, Aloha, OR 97006-0669 USA

Shipping Address: 19460 SW Shaw St. Aloha, OR 97078-1242 USA

Telephone: 503-649-7007 • *Flo-Lab Technical Support Toll Free:* 1-888-356-9522

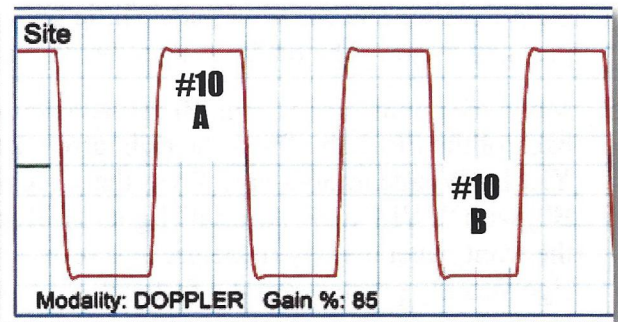
Fax: 503-591-9753 • *e-mail:* info@parksmed.com • *Web Site:* www.parksmed.com

FIELD CALIBRATION

1. Position the Flo-Lab cart with the back next to a sturdy table or workbench.
2. TURN THE CARTS MAIN POWER SWITCH OFF (O) (located on the lower right-hand side of the cart). Swing the monitor out of the way so you may remove the cover from the top and have access to the internal components. Remove the eighteen (18) screws holding the Flo-Lab top cover. Set the cover aside.
3. Inside the right front corner of the Flo-Lab you will see a gray colored metal box enclosure. Remove the four (4) screws (2 top right & 2 lower left) and take off the cover. Inside the enclosure there are five (5) plug-in circuit boards and one other board mounted behind at a right angle to the others.
4. Carefully remove the left most plug-in circuit card with the 8.3 marked on the silver box (it may be a different frequency like 9.7 if it has been changed). Replace it with the Model 80 calibration fixture card with the component side of the board facing to the left. Connect the cable that was furnished with the Model 80 card to the jack in the top of the card and to the \ominus EXTERNAL INPUT jack on the back of the Flo-Lab. *To verify the correct cable, see the back page, Equipment Images, for the continuity test.*
5. Turn ON (I) the Flo-Lab cart and computer. The computer will boot into Windows and automatically load the SonovaE software. From the opening menu press the "F3" key to open the CHART RECORDER screen. On the Model 80 calibration fixture, turn the POWER switch ON. Switch to either the CAL A or CAL B position.
6. On the Flo-Lab front panel, press the 8MHz button located under "DOPPLER/ON". Next press the MENU button (located directly to the left of the front panel LCD display (little green screen, firmware menu)) to advance to "5—EXTERNAL SIGNAL OFF". Press the UP arrow button (to the right of this display) to turn the signal ON. Press the Bleed/Def button under "CUFF INFLATOR".
7. Use the POSITION knob on the front panel of the Flo-Lab to move the white cursor position to the 1st division from the bottom of the display. Turn the SIZE control clockwise until the signal is maximized (100). Should display an 8 division signal, $\pm 10\%$ (7.5—8.5 divisions are good see figure 1, next page).
8. Press the MENU button to advance to "5—EXTERNAL SIGNAL ON". Press the UP arrow button to turn the signal OFF. Press DOPPLER/ON. Switch the Model 80 calibration fixture power OFF. Remove the cable between the Model 80 calibration fixture and the \ominus EXTERNAL INPUT jack. Press the Bleed/Def button under "Cuff Inflator" next to the inflate button.
9. On the Flo-Lab front panel, press the 8MHz button located under "DOPPLER/ON". On the left side of the Flo-Lab front panel, use the POSITION control to center the trace in the grid on the computer monitor. Turn the Flo-Lab SIZE control counter-clockwise to set SIZE A to 85.
10. Set the switches on the Model 80 calibration fixture to "A" and "ON". Verify there are 5 green LEDs under TOWARD lit. After 2 or 3 seconds, set the Model 80 to "B". Verify there are 5 red LEDs under AWAY lit (4-6 LEDs are acceptable on either side, if there are a lot more, say 10, call the factory; this is configured for 8.3 MHz, if the card is 9.7 MHz, there will be more). Switch back and forth from "A" to "B" several times. Press the F9 key to "freeze" the trace on the computer monitor. Please review the example in figure 2 on the next page.
11. The trace on the monitor will look like a square wave, 8 divisions in amplitude (7.5—8.5 as stated in #7).

- Note:** This test verifies the current calibration remains within factory specifications. If any major variations are noticed, please call Parks Medical Electronics, Inc. tech support at 1-888-356-9522.

Scope Screen Examples



Site #13 Output Filter

3.5 7 14 28

Modality: DOPPLER Gain %: 100



PRESSURE VERIFICATION

NOTE: For optimum performance for your Flo-Lab system, **use only the hoses furnished with the system.** The calibration of cuff volume and volume change is based on using the **nine foot black hoses connected to Ports A & B (not MPI hoses)** and adapters as furnished. Any other length or size of tubing or the addition of an in-line air chamber will cause the reported cuff volume to be increased or decreased by the increase/decrease in volume.

1. Connect an electronic pressure meter and manometer to the **BLACK** hose with **RED** ends (you will need to provide a 'T' type adapter to connect both instruments to one hose) which is connected to port "**A**" on the back of the Flo-Lab (**NOT** the MPI (Multi-Port Inflator)). Turn **ON** (☐) the Flo-Lab cart and computer. The computer will boot into Windows and automatically load the SonovaE software. From the opening menu press the "**F3**" key to open the CHART RECORDER screen. On the front panel press the PVR button. The only lights on the front panel will be "Channel A," "PVR" and "Arterial".
 - ♦ **SonovaE layout:** SonovaE columns are set for working with a patient that is laying on a bed next to the machine. The patients right side is the left column (Red) the patients left side is the right column (Yellow). We refer to the patients right (Red) or their left (Yellow) side.
2. **DO NOT USE THE FLO-LABS INTERNAL INFLATOR FOR THIS PROCEDURE** as your pressure meter may be damaged. **USE ONLY A HAND BULB TYPE OF MANOMETER.**
3. Pump the manometer to **40 mm** as read on your electronic pressure meter. Take note of the reading under "**CUFF A**" on the front panel display (little green screen, upper right corner) of the Flo-Lab and also the reading in the upper left of the computer monitor. The readings must be within 5mm of your electronic pressure meter reading (if the measurement reads significantly greater, call the factory).
4. Pump the pressure to **200mm** on your electronic pressure meter. Again compare the readings on the computer monitor and the front panel (little green screen, upper right corner) on the Flo-Lab to your electronic pressure meter. The readings must be within 5mm of your electronic pressure meter reading.
5. Move the connections to the **BLACK** hose with **YELLOW** ends which is connected to port "**B**" on the back of the Flo-Lab. Press the right arrow key on the keyboard to move the highlighted field to the **LEFT/YELLOW** side in SonovaE. Press the PVR button again. The front panel lights will switch to "**Channel B**", with "PVR" and "Arterial" lights lit. Repeat the tests as done in steps 2, 3 and 4. View "**CUFF B**" on the front panel display (little green screen, lower right corner) of the Flo-Lab. (if the measurement reads significantly greater, call the factory).
6. Disconnect your electronic pressure meter from the Flo-Lab. Press (**Esc**) out of the test screen. click on **QUIT** and select **SHUTDOWN**. Wait until the computer shuts down then turn **OFF (O)** the Flo-Lab main power switch.
7. Replace the Flo-Lab top cover and its eighteen (18) screws. Slide the monitor back into place.
8. The calibration tests are now complete. For cuff volume verification, proceed to the next page.

Testing for Port C has been removed from the SonovaE software due to lack of use.



CUFF VOLUME VERIFICATION/CALIBRATION

The Flo-Lab is totally automated and requires no additional action by the technologist above and beyond what is normally required to acquire good pulse volume waveforms. Your Flo-Lab has been calibrated at the factory to accurately determine the cuff volume. However, since the goal of calibrated pulse volume waveforms is to provide accurate and repeatable results, the technologist should initially and occasionally verify that the system is performing properly and should also be aware of several factors which can affect the results. The following information is provided to help you obtain the most accurate and meaningful pulse volume amplitude information. Please continue using the nine foot black hoses as stated on previous page for this calibration.

You must purchase the 1000 ml volume chamber from the factory (Parks part #986-3003-26) to perform the cuff volume verification/calibration test. Please call the factory at 1-800-547-6427, option 0.

1. Turn **ON** (☐) the Flo-Lab and computer. From the opening menu press the “**F3**” key to open the CHART RECORDER screen. The highlighted field will be the RIGHT/RED side which is channel A/Port A. Press the **PVR** button on the front panel. The only lights on the front panel will be “Channel A”, “PVR” and “Arterial”
2. On the Flo-Lab front panel, press the **MENU** button and advance to menu “8—PVR CAL. SEQUENCE OFF/ON”. Press the **UP** arrow button to turn the **PVR CAL** sequence **ON**. Connect the 1000 ml chamber to the **BLACK** hose with **RED** ends which is connected to the port “**A**” on the back of the Flo-Lab (**NOT** the MPI (Multi-Port Inflator)).
3. Verify your highlighted field (active field) is on the RIGHT/RED side. Press the “**INFLATE**” button. The Flo-Lab will inflate, deflate, then re-inflate the 1000 ml volume chamber (there could be a 40 second wait before the re-inflate occurs). As the second inflation starts, the calculated volume of the chamber will appear under the label “R Cuff (A):” on the left side of the graph on the computer monitor. The calculated volume should be within ± 3 of the value marked on the chamber. If not, press the “**MENU**” button to advance the menu to “9—PVR CAL. A FACTOR”. Use the worksheet on the following page to track your calculations. If the calculated volume was high, press the “**UP**” arrow button to increase the constant. If the volume was low, press the “**DOWN**” arrow button to decrease the constant. Press “**DEFLATE**”, then “**INFLATE**” to repeat the test. Note that an exact match may not occur, since the calculated volume changes by about 10 ml for each digit that the CAL factor is changed. Record the final “A CAL Factor” for future reference.
4. Connect the **BLACK** hose with **YELLOW** ends which is connected to port “**B**” to the 1000 ml volume chamber. Use an arrow key to switch the active field from the RIGHT/RED to the LEFT/YELLOW side. Press the **PVR** button for this side. The only lights on the front panel will be “Channel B,” “PVR” and “Arterial”. The calculated volume of the chamber will appear under the label “L Cuff (B):” on the left side of the graph on the computer monitor. B CAL factor is verified in the same way that A was, except the B CAL factor is displayed in the menu “10—PVR CAL, B FACTOR”. Please follow step #3 for cuff B volume verification. Record the final “B CAL Factor” for future reference.
5. The cuff volume calibration test is now complete. On the Flo-Lab front panel, press the **MENU** button and advance to menu “8—PVR CAL. SEQUENCE OFF/ON”. Press the **DOWN** arrow button to turn the **PVR CAL** sequence **OFF**. Press (**Esc**) out of the test screen. Click on “**Quit**” SonovaE then select **SHUT-DOWN**. Wait until the computer shuts down then turn **OFF (O)** the Flo-Lab main power switch. Replace the black hoses with the short pigtails. Place the black hoses in the drawer.



CUFF VOLUME VERIFICATION/CALIBRATION WORKSHEET

The volume calibration factor is easy for a technician to change. Check the #9 A CAL & #10 B CAL Factors in the firmware menu (little green screen) before starting. If you find your factors are a long way off, standard range is 90-110, save yourself some time by adjusting to 96 for a starting point.

In the table below, place the volume shown on your air chamber in the center column. You will be calibrating to this volume.

These instructions assume you are hooked up on the proper port and ready to start on #3 of the Cuff Volume Verification test on the previous page.

First check the CAL Factor for the port you are working on and write it in the appropriate CAL Factor column. Run your test and write the volume showing on the monitor in the Volume column. Calculate the difference between this volume and the value on the air chamber.

As stated in #3: If the calculated volume was high, press the “UP” arrow button to increase the constant. If the volume was low, press the “DOWN” arrow button to decrease the constant. Press “DEFLATE”, then “INFLATE” to repeat the test. Write the new CAL Factor in the next box. Keep repeating this process and writing down the corresponding volume. The calculated volume should be within +/- 3 of the value marked on the chamber.

If your air chamber is 997, then the target area will be 994-1000.

A CAL FACTOR	A VOLUME	AIR CHAMBER VOLUME	B CAL FACTOR	B VOLUME

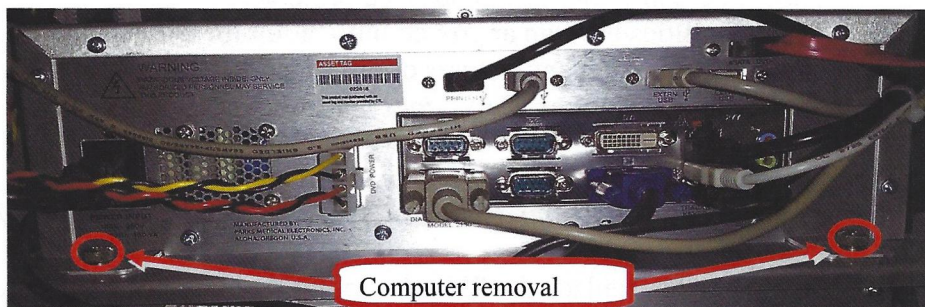
COMPUTER MAINTENANCE

During regular usage of your Flo-Lab, dust can accumulate inside the computer. Excess dust can cause the computer to run inefficiently or even prevent it from working at all. Dust in the computer has been known to cause the PC to freeze up. It is recommended that the computer be removed from the Flo-Lab cart and cleaned every six months.

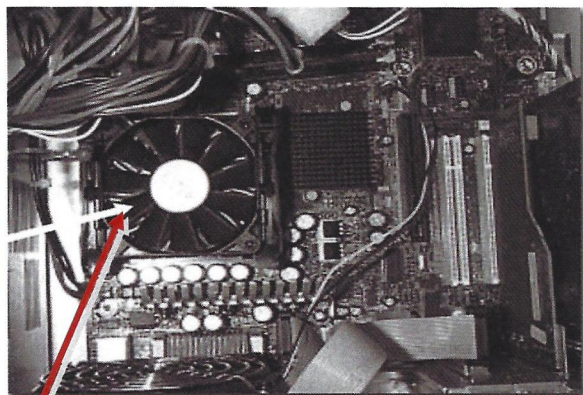
1. Unscrew the 4 Phillips head screws that hold the back access door closed

2. Take a picture of cable connections so you may return them to their original locations.

3. Disconnect the cables connected to the back of the computer (i.e., printer, monitor etc.) and unscrew the two screws holding the computer in.



4. Slide the computer out, remove the computers cover panel.



Processor Fan

5. Using compressed air or a vacuum hose, clean out the dust from the inside of the computer. Pay extra attention to the fan mounted directly on top of the processor (See Image Below). Also make sure you inspect the rest of the fans to make sure they are all operating correctly, the power supply fan and the case fan.

6. When finished, replace the cover on the computer and put it back into the Flo-Lab cart. Secure the computer in place with the two screws then replace the cables.

7. Once in Windows clean up Windows of old unneeded files and run the system defrag. Click Start> All Programs> Accessories> System Tools> Disk Cleanup then Disk Defragmenter. Click **Analyze**, when complete, click **Defragmenter** if needed. Also keep Windows up-to-date with Windows updates.

Microsoft Windows Updates on Parks Medical Electronics Flo-Labs

Parks Medical Electronics, Inc. encourages our customer to be up to date with all Microsoft Windows updates. This ensures that your system is running to its full potential.

Please Remember to never download or perform an update while the machines is being used. Exit out of all programs properly before the update.

Virus Protection

Parks Medical Electronics, Inc. recommends each facility install and update each machine with their virus protection software. We request the software to not be scanning or updating while the Flo-Lab is being used.

Computer Life Expectancy

The average life expectancy of a computer is five years. Due to technological advances, components to repair computers beyond five years start to become difficult to locate.

Please contact your sales rep for computer system upgrade information and prices.

SMC COUPLINGS

As a part of the annual PM procedure we have decided to add maintenance of the SMC Couplings on the hoses. Since changing the luers from the slip bayonet style to the locking SMC Couplings, it is necessary to verify the condition of the O-rings on the male SMC Couplings. If these are checked/changed annually, it will help minimize the down time of the machine due to leaks between the hose and cuff. As any O-ring will dry and crack with age, it is recommended to keep a supply of O-rings on hand. Frequently using an O-ring lube such as shown below will help keep the O-rings from drying out. The lube should be non-toxic, FDA approved preferable.

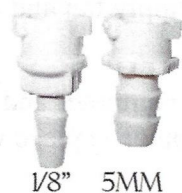
Many facilities have an approved lubrication for O-rings. If you do not, the image below is recommended from the manufacturer of our Locking SMC Couplings. It contains their website and customer service phone number. *Parks does not sell O-ring lube.*

Please use the part numbers below to order replacement SMC Coupling and/or O-rings.
We have a \$30.00 minimum order. Please call the 800-547-6427 option '0' to place the order.

If you need to replace the SMC Coupling for cuffs and hoses, we do have the original SMC Coupling kits available which consist of the following:

P# **986-0119-00** has [20>5mm Female, 10>1/8" Female, 2 each color white, blue, green, orange black, 3 yellow and 1 red male SMC Couplings] **(SCM Couplings kit with MPI)**

P# **986-0118-00** has [20>5mm Female, 10>1/8" Female, 1 red and 1 yellow male SMC Couplings] **(SCM Couplings kit without MPI)**



Female SMC Couplings for cuffs.

986-0103-00R 1/8" Female SMC Coupling (digit cuffs)

986-0104-00R 5 mm Female SMC Coupling (blue cuffs)



MPI hose set bundled with gray mesh. New as of 10/2012

986-0114-01 Kit w/ (6) Red & (6) Yellow Male SMC Couplings only

986-0111-00R Yellow male SMC Coupling (also used on 9' black hoses)

986-0113-00R Red male SMC Coupling (also used on 9' black hoses)

Replacement O-rings 986-0116-01 (15) O-rings



MPI hose set bundled together with black mesh (older)

986-0100-00R White male SMC Coupling

986-0109-00R Blue male SMC Coupling

986-0110-00R Green male SMC Coupling

986-0111-00R Yellow male SMC Coupling

986-0112-00R Orange male SMC Coupling

986-0108-00R Black male SMC Coupling

Replacement O-rings 986-0116-01(15) O-rings



Magic Lube "O" Ring Lube PTFE Based Lubricant/Sealant—1oz Tube
 Customer Service 1-866-426-7663 Monday—Friday 10AM—5PM EST

<http://www.123ponds.com/ap630.html>

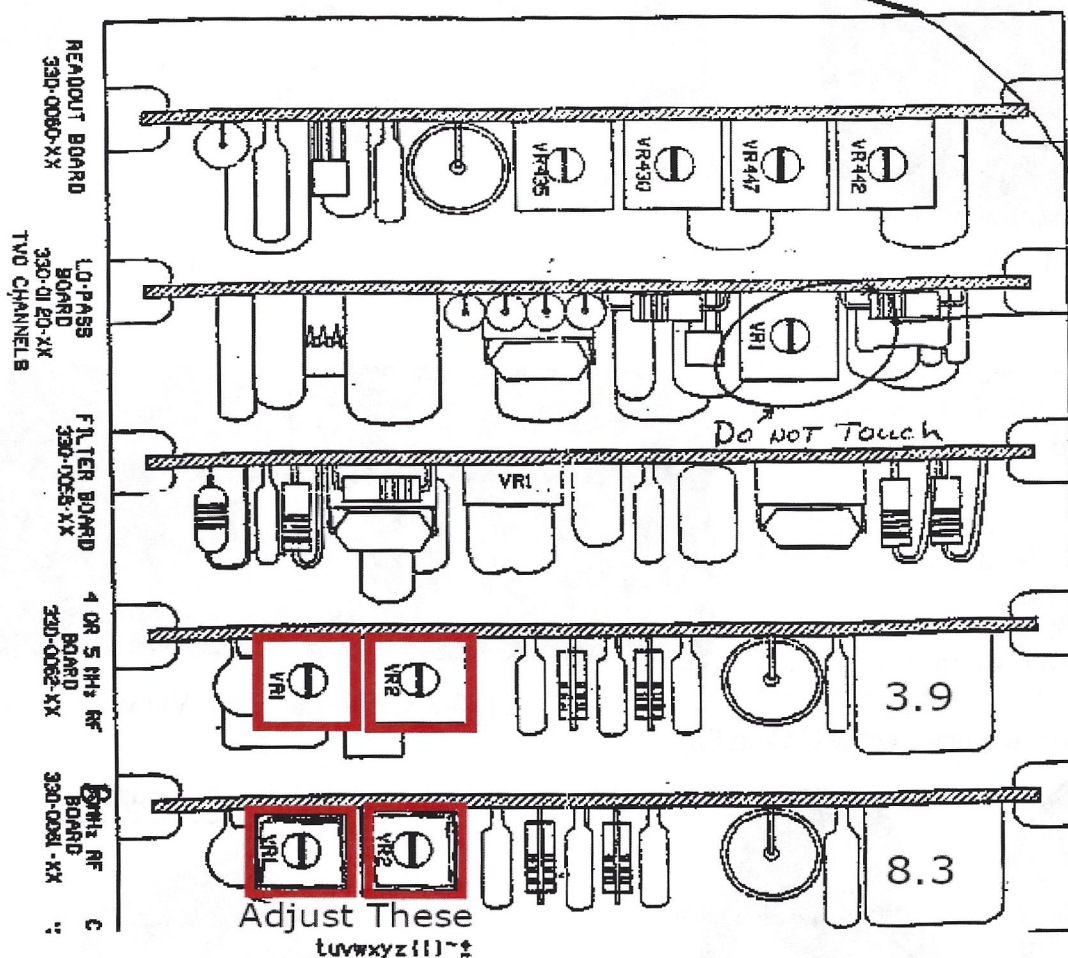
*Parks does **not** sell O-ring lube*

ZERO-CROSS DOPPLER RF BOARD CALIBRATION

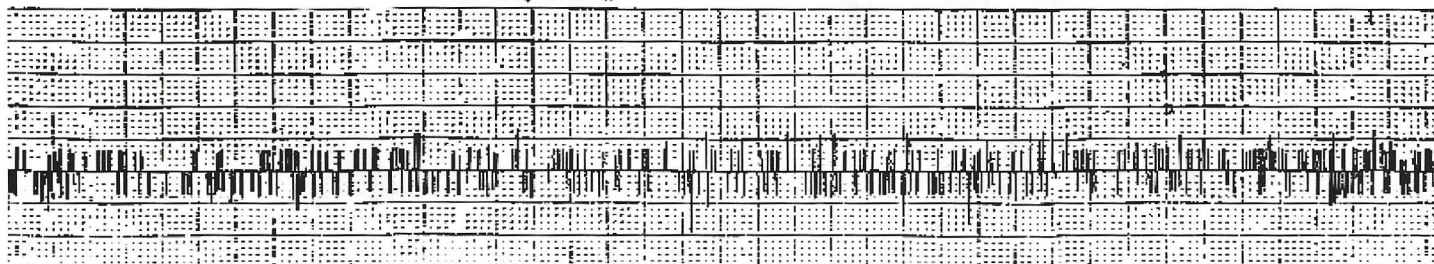
ZERO-CROSS ADJUSTMENT

- ✓ CONNECT DRY PROBE AND TURN ON DOPPLER to proper frequency
- ✓ SELECT 28Hz OUTPUT FILTER
- ✓ SET CH A SIZE AT MAXIMUM
- ✓ TURN VOLUME UP TO MONITOR BACKGROUND NOISE
- ✓ WITH PROBE STILL DRY (NO GEL), NO NOISE EXCEPT SMOOTH WHITE NOISE, LOOK FOR THIS OUTPUT. ADJUST VR1 AND VR2 AS NECESSARY TO APPROXIMATE IT.

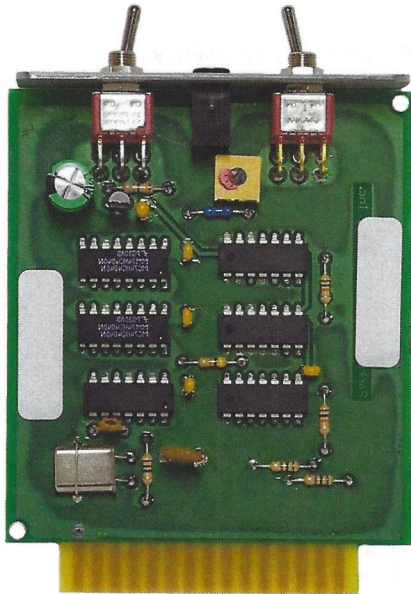
ADJUSTMENT LOCATOR



Adjust These
tuvwxyz{|}~±



EQUIPMENT IMAGES



Model 80 Card. P# 80-2100

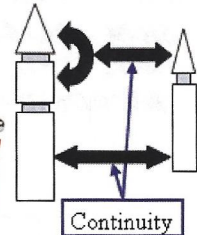


Model 80
Switch View



Model 80 cable
Comes with the Model 80
card

2100 Cable Plugs



Also need an electronic pressure meter.
Parks does NOT sell these meters.
They are standard in most Biomedical
shops.

Finish out your Calibration kit with
988-1104-00 9' Black hose
986-0116-01 O-Rings
O-Ring Lube (FDA Approved)

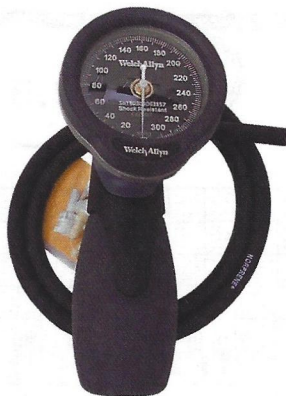


2100-SX2 Flo-Lab Back View

Sphygmomanometer w/SMC Coupling



989-1104-10
Riester



989-1105-10
Welch Allyn

Includes SMC Coupling



1000cc Air Chamber. P# 986-3003-26